

WHAT IS CLAIMED IS:

1 1. A concrete mixing truck for transporting concrete from one
2 location to another comprising:

3 a chassis including: a frame, wheels coupled to the frame, a first
4 power source coupled to the frame, and a first drivetrain coupling the first
5 power source and the wheels;

6 a second drivetrain coupled to a second power source; and

7 a mixing drum coupled to the frame and to the second drivetrain,
8 the drum comprising:

9 a wall including an inner surface defining a volume and an
10 outer surface; and

11 at least one formation integrally formed as a single unitary
12 body with at least a portion of the wall and extending from the inner surface of
13 the wall, the formation including a tapered base region proximate the inner
14 surface of the wall.

1 2. The concrete mixing truck of claim 1, wherein the first power
2 source and the second power source are the same power source.

1 3. The concrete mixing truck of claim 1, wherein the width of the
2 tapered base region decreases as the base region extends further from the
3 inner surface of the wall.

1 4. The concrete mixing truck of claim 1, wherein the width of the
2 tapered base region proximate the inner surface of the wall is approximately six
3 inches.

1 5. The concrete mixing truck of claim 1, wherein the tapered base
2 region extends approximately five inches from the inner surface of the wall.

1 6. The concrete mixing truck of claim 1, wherein the taper of the
2 base region is radiused.

- 1 7. The concrete mixing truck of claim 6, wherein the radius of the
2 taper is constant.
- 1 8. The concrete mixing truck of claim 6, wherein the radius of the
2 taper is no less than 10 mm.
- 1 9. The concrete mixing truck of claim 1, wherein the formation
2 further comprises an intermediate region and an end region.
- 1 10. The concrete mixing truck of claim 9, wherein a support member
2 is embedded within the end region of the formation.
- 1 11. The concrete mixing truck of claim 10, further comprising at least
2 one spacer embedded within the end region.
- 1 12. The concrete mixing truck of claim 11, wherein the at least one
2 spacer resiliently engages the support member.
- 1 13. The concrete mixing truck of claim 1, wherein the inner surface of
2 the wall includes a seam.
- 1 14. The concrete mixing truck of claim 13, further comprising a first
2 ramp extending from the inner surface of the wall proximate the seam.
- 1 15. The concrete mixing truck of claim 1, wherein the formation and
2 the wall are integrally formed as part of a single unitary body.
- 1 16. The concrete mixing truck of claim 1, further comprising a drive
2 ring coupled to the wall.
- 1 17. The concrete mixing truck of claim 1, wherein the wall includes an
2 opening.
- 1 18. The concrete mixing truck of claim 17, wherein the drum includes
2 a hatch cover releasably coupled to the opening.

1 19. The concrete mixing truck of claim 18, wherein the hatch cover
2 includes a first panel on a first side of the opening and a second panel on a
3 second side of the opening, and wherein the first panel is coupled to the
4 second panel.

1 20. A heavy duty rotary concrete mixing drum for coupling to a
2 vehicle having a powered drivetrain for rotating the drum, the drum comprising:
3 a wall including an inner surface defining a volume; and
4 at least one projection integrally formed as a single unitary body
5 with the wall and extending from the inner surface of the wall, the projection
6 including a tapered base region proximate the inner surface of the wall.

1 21. The mixing drum of claim 20, wherein the projection and the wall
2 are integrally formed as part of a single unitary body.

1 22. The mixing drum of claim 20, wherein the width of the tapered
2 base region decreases as the base region extends further from the inner
3 surface of the wall.

1 23. The mixing drum of claim 20, wherein the tapered base region
2 extends approximately five inches from the inner surface of the wall.

1 24. The mixing drum of claim 20, wherein the width of the tapered
2 base region proximate the inner surface of the wall is approximately six inches.

1 25. The mixing drum of claim 20, wherein the taper of the base region
2 is radiused.

1 26. The mixing drum of claim 25, wherein the radius of the taper is
2 constant.

1 27. The mixing drum of claim 25, wherein the radius of the taper is no
2 less than 10 mm.

1 28. The mixing drum of claim 20, wherein the projection further
2 comprises an intermediate region and an end region.

1 29. The mixing drum of claim 28, further comprising a support
2 member embedded within the end region of the projection.

1 30. The mixing drum of claim 29, wherein the support member is
2 torsionally flexible.

1 31. The mixing drum of claim 29, further comprising a plurality of
2 spacers embedded within the end region, each spacer substantially surrounding
3 the support member.

1 32. The mixing drum of claim 31, wherein each spacer includes an
2 outside diameter and an inside diameter when the spacer is wrapped around
3 the support member.

1 33. The mixing drum of claim 32, wherein at least a portion of the
2 outside diameter of each spacer lies on the surface of the formation.

1 34. The mixing drum of claim 20, wherein the formation extends
2 around the inner surface of the wall in the form of an archimedian spiral.

1 35. The mixing drum of claim 20, wherein the wall comprises an inner
2 layer and an outer layer.

1 36. The mixing drum of claim 35, wherein the first layer is an
2 elastomeric material.

1 37. The mixing drum of claim 36, wherein the outer layer is a fiber
2 reinforced composite material.

1 38. The mixing drum of claim 37, wherein the formation is integrally-
2 formed with the inner layer.

1 39. The mixing drum of claim 20, wherein the wall includes a seam.

1 40. The mixing drum of claim 39 further comprising at least one ramp
2 extending from the inner surface of the drum proximate the seam.

1 41. The mixing drum of claim 20, wherein the wall includes an
2 opening.

1 42. The mixing drum of claim 41, further comprising a hatch cover
2 releasably coupled to the opening in the wall.

1 43. The mixing drum of claim 20, further comprising a drive ring
2 coupled to the wall, the drive ring being configured to couple to the powered
3 drivetrain of the vehicle.

1 44. The mixing drum of claim 43, wherein the drive ring comprises a
2 hub configured to be coupled to the powered drivetrain of a vehicle and a
3 plurality of hollow extensions extending radially outwardly from the periphery
4 of the drive ring into the wall of the drum.

1 45. A heavy duty rotary concrete mixing drum for coupling to a
2 vehicle having a powered drivetrain for rotating the drum, the drum comprising:
3 a wall including an inner layer and an outer layer, the inner layer
4 including a first section and a second section, at least one of the first section
5 and the second section extending from an axial end of the drum across an axial
6 midpoint of the drum, each of the first section and the second section having
7 an inner surface; and

8 a first projection coupled to the inner layer of the first section and
9 extending from the inner surface of the first section, the projection including a
10 tapered base region proximate the inner surface of the first section.

1 46. The mixing drum of claim 45, wherein the tapered base region is
2 radiused.

1 47. The mixing drum of claim 46, wherein the first projection extends
2 around the inner surface of the first section in the form of an archimedian
3 spiral.

1 48. The mixing drum of claim 47, wherein the inner layer is an
2 elastomeric material.

1 49. The mixing drum of claim 48, wherein the outer layer is a fiber
2 reinforced composite material.

1 50. The mixing drum of claim 45, wherein the first projection and the
2 first section are integrally-formed as part of a single unitary body.

1 51. The mixing drum of claim 45, wherein a seam is formed between
2 the first section and the second section.

1 52. The mixing drum of claim 51, wherein the first section includes a
2 ramp extending from the inner surface of the first section proximate the seam.

1 53. The mixing drum of claim 52, wherein the second section includes
2 a ramp extending from the inner surface of the section proximate the seam.

1 54. The mixing drum of claim 52, further comprising a second
2 projection coupled to the second section.

1 55. A spiraling formation for use within a heavy duty, rotary concrete
2 mixing drum capable of attachment to a vehicle, the formation comprising a
3 body configured to extend inwardly from an inner wall of the drum, the body
4 having a base portion and a free end, the base portion including at least one
5 tapered surface, the formation being of a length configured to spirally extend
6 from an axial end of the drum across an axial midpoint of the drum.

1 56. The formation of claim 55, wherein the body is formed from at
2 least one polymeric material.

1 57. The formation of claim 55, wherein the greatest width of the
2 tapered base portion is approximately six inches.

1 58. The formation of claim 57, wherein the greatest height of the
2 tapered base portion has a maximum height of approximately five inches.

1 59. The formation of claim 55, wherein the width of the tapered base
2 region decreases as the base region extends further from the inner surface of
3 the wall.

1 60. The formation of claim 55, wherein the at least one tapered
2 surface of the base portion is radiused.

1 61. The formation of claim 60, wherein the radius of the at least one
2 tapered surface is constant.

1 62. The formation of claim 60, wherein the radius of the taper is no
2 less than 10 mm.

1 63. The formation of claim 55, wherein the formation further
2 comprises an intermediate region and an end region.

1 64. The formation of claim 63, wherein a support member is
2 embedded within the end region of the formation.

1 65. The formation of claim 64, further comprising at least one spacer
2 embedded within the end region.

1 66. The formation of claim 65, wherein the at least one spacer
2 resiliently engages the support member.

3 67. The formation of claim 56, wherein the body has a midportion
4 between the base portion and the free end formed entirely from one or more
5 layers formed substantially from at least one non-metallic material.